Environmental and Sustainability Sciences, BS (Boston)

Our Bachelor of Science in Environmental and Sustainability Sciences is designed to provide students comprehensive and transdisciplinary skills needed to tackle the pressing environmental problems we face. Our core curriculum is grounded in a solid foundation in Earth systems, ecology, sustainable development, and required skills courses in data management and geographic information systems. Students then diverge into one of four concentrations. For students interested in the interface of social and ecological systems and who want to view environmental problem solving through a social science lens, we have a concentration in environment and society. For students interested in the nexus of food, water, and energy, our concentration in sustainable development and planning might be most appropriate. Is the conservation of organisms and their ecosystems the area you are most interested in? Our concentration in conservation, restoration, and management may be the best choice. Lastly, for students interested in understanding environmental problem solving from an Earth systems perspective, courses in our Earth, oceans, and environmental change concentration will satisfy your curiosity. In the final semester, our students build teams that bring the skills developed across the varied concentrations back together to learn from each other and to work with our partners to solve specific environmental challenges presented by our stakeholders. Combined, this degree seeks to prepare students to work across a wide array of disciplines to help solve the environmental challenges of the future.

There are a number of interdisciplinary opportunities involving Environmental and Sustainability Sciences. Due to curricular overlap, combinations of any Environmental and Sustainability Sciences major, including combined majors, cannot occur with majors or minors in Ecology and Evolutionary Biology or Environmental Studies, or with the minor in Geoscience.

Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (https://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

Environmental and Sustainability Sciences Major Requirements

Code	Title	Hours
Introduction to College		
INSC 1000	Science at Northeastern	1
Core Curriculum		
EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	5
ENVR 1200 and ENVR 1201	Dynamic Earth and Lab for ENVR 1200	4-5
or ENVR 2200	Earth's Changing Cycles	
ENVR 1400 and ENVR 1401	Foundations in Environmental and Sustainability Sciences and Lab for ENVR 1400	5
ENVR 1500 and ENVR 1501	Introduction to Environmental, Social, and Biological Data and Lab for ENVR 1500	5
ENVR 2515	Sustainable Development	4
ENVR 3300 and ENVR 3301	Geographic Information Systems and Lab for ENVR 3300	5
ENVR 4000	Science Communication and Professional Development	4
ENVR 4050	Solving Emerging Environmental Challenges through Capstone	4
or ENVR 4971	Junior/Senior Honors Project 2	
or ENVR 4997	Senior Thesis	
Mathematics Requirements		
ENVR 2500 and ENVR 2501	Biostatistics and Lab for ENVR 2500	4-5
or ECON 2350	Statistics for Economists	
or POLS 2400	Quantitative Techniques	
or SOCL 2321	Research Methods in Sociology	

MATH 1241	Calculus 1	4
or MATH 1341	Calculus 1 for Science and Engineering	

Environmental and Sustainability Sciences Concentrations

Complete one of the following concentrations:

- Conservation, Restoration, and Management (p. 2)
- Earth, Oceans, and Environmental Change (p. 3)
- Environment and Society (p. 4)
- Sustainable Planning and Development (p. 5)

Writing Requirements

Code	Title	Hours
ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	
ENGW 3307	Advanced Writing in the Sciences	4
or ENGW 3303	Advanced Writing in the Environmental Professions	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Co-op Requirements

Code	Title	Hours
Students who want to participate in co-op will need to complete EESC 2000 Professional Development for Co-op.		
EESC 2000	Professional Development for Co-op	1

Environmental and Sustainability Sciences Major Credit Requirement

Complete 86 semester hours in the major.

Science GPA Requirement (Environmental and Sustainability Sciences)

A minimum 2.000 GPA in the following course codes is required: ENVR, EEMB

NUPath Requirements

The following NU Path requirements are fulfilled by required courses in the major.

- Analyzing and Using Data (AD)
- Conducting Formal and Quantitative Reasoning (FQ)
- Demonstrating Thought and Action in a Capstone (CE)
- Engaging with the Natural and Designed World (ND)
- Exploring Creative Expression and Innovation (EI)
- Two Writing Intensive Courses in the Discipline (WI)
- Understanding Societies and Institutions (SI)

Other NUPath requirements may be fulfilled by electives in the major

Program Requirement

128 total semester hours required.

CONSERVATION, RESTORATION, AND MANAGEMENT CONCENTRATION

Code	Title	Hours
Required Conservation, Restoration, and Management Courses		
EEMB 2400	Introduction to Evolution	4
EEMB 3455	Ecosystems Ecology	4
or CIVE 3430	Engineering Microbiology and Ecology	
EEMB 3460	Conservation Biology	4
EEMB 4001	Landscape and Restoration Ecology	4
Conservation, Restoration, and Management Electives		
Complete six of the following:		24-26
EEMB 2610	Plant Biology	

EEMB 3250	Freshwater Ecology
EEMB 3465	Ecological and Conservation Genomics
EEMB 3466	Disease Ecology
EEMB 3475	Wildlife Ecology
EEMB 4000	Applied Conservation Biology
ENVR 2401	Food Justice and Community Development
ENVR 3150	Food Security and Sustainability
ENVR 3200	Water Resources
ENVR 3540	Environmental Psychology
ENVR 3800 and ENVR 3801	Plants and Society and Lab for ENVR 3800
ENVR 3850	Sustainable Agriculture
ENVR 4500 and ENVR 4501	Applied Hydrogeology and Lab for ENVR 4500
ENVR 4505	Wetlands
ENVR 4970	Junior/Senior Honors Project 1
ENVR 5190	Soil Science
ENVR 5220	Ecosystem-Based Management
ENVR 5350	Sustainable Energy and Climate Solutions
ENVR 5450	Applied Social-Ecological Systems Modeling
ENVR 5563	Advanced Spatial Analysis
ENVR 5700	Streams and Watershed Ecology
ENVR 5750	Urban Ecology

EARTH, OCEANS, AND ENVIRONMENTAL CHANGE CONCENTRATION

Code	Title	Hours
Earth Materials and Landforms		
Complete one of the following:		5
ENVR 2310 and ENVR 2311	Earth Materials and Lab for ENVR 2310	
ENVR 2340 and ENVR 2341	Earth Landforms and Processes and Lab for ENVR 2340	
Freshwater		
Complete one of the following:		4-5
ENVR 3200	Water Resources	
ENVR 4500 and ENVR 4501	Applied Hydrogeology and Lab for ENVR 4500	
ENVR 4505	Wetlands	
ENVR 5700	Streams and Watershed Ecology	
Oceans		
Complete one of the following:		4
ENVR 3125	Global Oceanic Change	
ENVR 3600	Oceanography	
Chemistry		
Complete one of the following:		5
CHEM 1151 and CHEM 1153	General Chemistry for Engineers and Recitation for CHEM 1151	
CHEM 1161 and CHEM 1162 and CHEM 1163	General Chemistry for Science Majors and Lab for CHEM 1161 and Recitation for CHEM 1161	
CHEM 1211 and CHEM 1212 and CHEM 1213	General Chemistry 1 and Lab for CHEM 1211 and Recitation for CHEM 1211	
Physics		
Complete one of the following:		5

PHYS 1145 and PHYS 1146	Physics for Life Sciences 1 and Lab for PHYS 1145	
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
PHYS 1161 and PHYS 1162 and PHYS 1163	Physics 1 and Lab for PHYS 1161 and Recitation for PHYS 1161	
Earth, Oceans, and Environmental Change Electives		
Complete five of the following:		20-22
CIVE 5280	Remote Sensing of the Environment	
EEMB 3250	Freshwater Ecology	
ENVR 2200	Earth's Changing Cycles	
ENVR 2310 and ENVR 2311	Earth Materials and Lab for ENVR 2310	
ENVR 2340 and ENVR 2341	Earth Landforms and Processes and Lab for ENVR 2340	
ENVR 3125	Global Oceanic Change	
ENVR 3200	Water Resources	
ENVR 3435	Environmental Pollution: Fate and Transport	
ENVR 3600	Oceanography	
ENVR 4500 and ENVR 4501	Applied Hydrogeology and Lab for ENVR 4500	
ENVR 4504	Environmental Pollution	
ENVR 4505	Wetlands	
ENVR 4970	Junior/Senior Honors Project 1	
ENVR 5150	Climate and Atmospheric Change	
ENVR 5190	Soil Science	
ENVR 5201	Geologic Field Seminar	
ENVR 5202	Environmental Science Field Seminar Abroad	
ENVR 5670	Global Biogeochemistry	
ENVR 5700	Streams and Watershed Ecology	

ENVIRONMENT AND SOCIETY CONCENTRATION

Code	Title	Hours
Required Environment and Society Courses		
ENVR 3540	Environmental Psychology	4
ENVR 3850	Sustainable Agriculture	4-5
or ENVR 3800 and ENVR 3801	Plants and Society and Lab for ENVR 3800	
SOCL 1246	Environment and Society	4
SOCL 2485	Environment, Technology, and Society	4
or POLS 2395	Environmental Politics and Policy	
Environment and Society Electives		
Complete six of the following:		24-25
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
EEMB 3460	Conservation Biology	
EEMB 4000	Applied Conservation Biology	
ENVR 2401	Food Justice and Community Development	
ENVR 3150	Food Security and Sustainability	
ENVR 3800 and ENVR 3801	Plants and Society and Lab for ENVR 3800	
ENVR 4970	Junior/Senior Honors Project 1	
ENVR 5000	Community Stakeholder Engagement in Environmental Management and Research	
ENVR 5210	Environmental Planning	

ENVR 5220	Ecosystem-Based Management
ENVR 5350	Sustainable Energy and Climate Solutions
ENVR 5600	Coastal Processes, Adaptation, and Resilience
ENVR 5610	Technology and the Blue Economy
ENVR 5750	Urban Ecology
ENVR 5800	Climate Adaptation and Nature-Based Solutions
INTL 5100	Climate and Development
PPUA 5260	Ecological Economics
PPUA 5264	Energy Democracy and Climate Justice: Technology, Policy, and Social Change
PPUA 5268	International Environmental Policy

SUSTAINABLE PLANNING AND DEVELOPMENT CONCENTRATION

Code	Title	Hours
Required Sustainable Planning and Development Courses		
ENVR 3150	Food Security and Sustainability	4
ENVR 3200	Water Resources	4
ENVR 5210	Environmental Planning	4
ENVR 5350	Sustainable Energy and Climate Solutions	4
or ENVR 5800	Climate Adaptation and Nature-Based Solutions	
PPUA 5268	International Environmental Policy	4
Sustainable Planning and Development Electives		
Complete five of the following:		20-22
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
EEMB 3250	Freshwater Ecology	
EEMB 3460	Conservation Biology	
EEMB 4000	Applied Conservation Biology	
EEMB 4001	Landscape and Restoration Ecology	
ENVR 2401	Food Justice and Community Development	
ENVR 3540	Environmental Psychology	
ENVR 3800 and ENVR 3801	Plants and Society and Lab for ENVR 3800	
ENVR 4500 and ENVR 4501	Applied Hydrogeology and Lab for ENVR 4500	
ENVR 4505	Wetlands	
ENVR 4970	Junior/Senior Honors Project 1	
ENVR 5000	Community Stakeholder Engagement in Environmental Management and Research	
ENVR 5190	Soil Science	
ENVR 5220	Ecosystem-Based Management	
ENVR 5350	Sustainable Energy and Climate Solutions	
ENVR 5450	Applied Social-Ecological Systems Modeling	
ENVR 5563	Advanced Spatial Analysis	
ENVR 5610	Technology and the Blue Economy	
ENVR 5800	Climate Adaptation and Nature-Based Solutions	
PPUA 5260	Ecological Economics	

Plan of Study

Sample Plans of Study

FOUR YEARS, TWO CO-OPS IN SPRING/SUMMER FIRST HALF

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
INSC 1000	1	EEMB 2302 and EEMB 2303	5	Vacation		General Elective	4
ENGW 1111	4	ENVR 1200 and ENVR 1201	5			General Elective	4

ENVR 1400 and ENVR 1401	5	MATH 1241	4				
ENVR 1500 and ENVR 1501	5	NUPath Elective 1	4				
General Elective	4						
	19		**18**		**0**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EESC 2000	1	Co-op	0	Co-op	0	General Elective	4
ENVR 2515	4					NUPath Requirement 2	4
ENVR 3300 and ENVR 3301	5						
ESS concentration 1	4						
ESS Concentration 2	4						
	18		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ENVR 2500 and ENVR 2501	5	Co-op	0	Co-op	0	NUPath Elective 3	4
ESS concentration 3	4					ENGW 3307	4
ESS concentration 4	4						
ESS concentration 5	4						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
ESS concentration 6	4	ENVR 4000	4
ESS concentration 7	4	ENVR 4050	4
ESS Concentration 8	4	ESS Concentration 9	4
Elective	4	ESS Concentration 10	4
	16		**16**

Total Hours: 128

FOUR YEARS, TWO CO-OPS IN SUMMER SECOND HALF/FALL

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
INSC 1000	1	EEMB 2302 and EEMB 2303	5	Vacation		General Elective	4
ENGW 1111	4	ENVR 1200 and ENVR 1201	5			General Elective	4
ENVR 1400 and ENVR 1401	5	MATH 1241	4				
ENVR 1500 and ENVR 1501	5	NUPath Elective 1	4				
General Elective	4						
	19		**18**		**0**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
EESC 2000	1	ENVR 2500 and ENVR 2501	5	General Elective	4	Co-op	0
ENVR 2515	4	ESS concentration 3	4	NUPath Elective 2	4		
ENVR 3300 and ENVR 3301	5	ESS concentration 4	4				
ESS concentration 1	4	ESS concentration 5	4				

ESS Concentration 2	4						
	18		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	ESS concentration 6	4	NUPath Elective 3	4	Co-op	0
		ESS concentration 7	4	ENGW 3307	4		
		ESS concentration 8	4				
		General Elective	4				
	0		**16**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	ENVR 4000	4
		ENVR 4050	4
		ESS Concentration 9	4
		ESS Concentration 10	4
	0		**16**

Total Hours: 128